

REMARKS/ARGUMENTS

This is a Response to the Office Action mailed October 7, 2005, in which a three (3) month Shortened Statutory Period for Response has been set, due to expire January 7, 2006. Enclosed is our check to cover the fee for a two (2)-month extension of time, to March 7, 2006. Claim 1 is being canceled herein without prejudice, while claims 36-38 were previously canceled without prejudice. Claims 26-35 were previously withdrawn from consideration pursuant to a Restriction Requirement and election of claims. No new matter has been added to the application. No fee for additional claims is due by way of this Amendment. The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090. Claims 2-35 and 39 are currently pending in the application.

Telephone Interview

Applicants thank Examiner Peng for conducting a telephone interview with David V. Carlson, Reg. No. 31,153 (Attorney of Record) on February 28, 2006. During the telephone conversation with Examiner Peng, Mr. Carlson and Examiner Peng discussed the claims in view of the prior art. An agreement was reached regarding allowable claim language for independent claims 1 and 17. Specifically, the Examiner indicated that he would allow independent claims 1 and 17 if amended to include the recitations of claim 3. The applicants further thank Examiner Peng for this indication of allowable subject matter.

Accordingly, claim 3 has been rewritten in independent form to include the recitations of its base claim 1, with claim 1 now canceled. Newly independent claim 3 is now allowable. Independent claims 17 and 39 are amended to include recitations along the lines of those indicated to be allowable from claim 3, and are now allowable as well.

The various dependent claims that previously depended upon claim 1 are amended as shown to change their dependency based on newly independent claim 3. The various claims are also amended as shown to provide proper antecedent basis or to otherwise place these claims in better form.

Objections

Claims 13-16 were objected to as being dependent upon a rejected base claim, but were indicated by Examiner Peng to be allowable if rewritten in independent form. The applicants thank Examiner Peng for this indication of allowable subject matter.

Given the allowability of newly independent claim 3, the applicants have not rewritten claims 13-16 in independent form. However, the applicants may consider rewriting claims 13-16 in independent form if Examiner maintains rejections in a subsequent Office Action and continues to indicate that claims 13-16 contain allowable subject matter.

Rejections Under 35 U.S.C. § 112, First Paragraph

Claim 1 was rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement, due to the recitation of “the extension of the first core having the same surface smoothness as the first core.” Newly independent claim 3 has been rewritten in a manner that addresses this rejection and/or renders this rejection moot.

Rejections Under 35 U.S.C. § 102(b)

Claims 1-12 were rejected under 35 U.S.C. § 102(b) as being anticipated by Shani et al. (article entitled “Efficient coupling of a semiconductor laser to an optical fiber by means of a tapered waveguide on silicon”). For the reasons set forth below, the applicants respectfully disagree with this rejection.

A disclosed embodiment will now be discussed in comparison to the applied references. Of course, the discussion of the disclosed embodiment, and the discussion of the differences between the disclosed embodiment and subject matter described in the applied references, do not define the scope or interpretation of any of the claims. Instead, such discussed differences are intended to merely help the Examiner appreciate important claim distinctions discussed thereafter.

As disclosed by the applicants in the present application, an embodiment provides a first optical waveguide having a first core and a first cladding covering substantially the whole surface of the first core. A center of the first core and a center of the second core are positioned

substantially on a common axis. The first cladding of an embodiment comprises an upper and lower cladding that covers the whole surface of the first core. The upper and lower cladding are from the same material, thereby allowing for the extensions of *both* the upper and lower claddings to serve as a second core in a second waveguide. Having upper and lower claddings of the same material allows for the center of the first and second cores to be substantially positioned on the same axis. Positioning the core centers on the same axis allows for the center of beam spot propagating through the first core to be aligned with the center of beam spot propagating through the second core. As such, there is minimal propagation loss during spot size transformation.

Newly independent claim 3 recites, *inter alia*, “a first optical waveguide having a first core and a first cladding covering substantially the whole surface of the first core ... a center of the first core and a center of the second core are positioned substantially on a common axis.” This feature is not disclosed, taught, or suggested by Shani.

As discussed in the telephone interview with the Examiner, Shani teaches of a loose mode core (second core) and a tight mode core (first core) *resting on* a bottom cladding layer of SiO₂. The tight mode core has an upper cladding of phosphorsilicate glass material. Thus, the loose mode core is an extension of the upper cladding layer and not of the bottom cladding layer, since the core cannot comprise more than one material type. Consequently, the center of the tight mode core is not aligned with the center of the loose mode core, thereby resulting in substantial propagation loss during spot size transformation.

Shani does not disclose, teach or suggest having the centers of the first and second cores positioned substantially on a common axis, as recited in independent claim 3. Consequently, independent claim 3 is allowable, as well as claims 2-16, which depend therefrom.

Rejections Under 35 U.S.C. § 103

Claims 17-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Oh et al. (U.S. Patent No. 6,813,417) in view of Tobita et al. (U.S. Patent No. 5,157,746).

Amended claim 17 recites, *inter alia*, “a center of the first core and a center of the second core are positioned substantially on a common axis.” As described above with regards to

an example embodiment provided by the present applicants, positioning the core centers on the same axis allows for the center of beam spot propagating through the first core to be aligned with the center of beam spot propagating through the second core. As such, there is minimal propagation loss during spot size transformation.

Oh teaches of a tapered electrooptic (EO) polymer waveguide coupling a passive polymer waveguide to an EO polymer waveguide. The tapered waveguide varies in *thickness* so that it can be sandwiched between the passive waveguide cladding layers. The tapered waveguide becomes gradually *thinner* and not narrower, as the tapered waveguide extends from the EO waveguide to the passive waveguide. Thus, the center of the EO waveguide is positioned higher than the center of the passive waveguide. Consequently, the waveguide centers are not positioned on the same axis resulting in substantial beam spot propagation loss.

Oh does not disclose, teach or suggest having the centers of the first and second cores substantially positioned on a common axis. Tobita further does not cure the deficiencies of Oh. Consequently, amended claim 17 is allowable, as well as claims 18-19, which depend therefrom.

Claims 20-25 and 39 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Oh et al. (U.S. Patent No. 6,813,417) and Tobita et al. (U.S. Patent No. 5,157,746) further in view of Bonar et al. (U.S. Patent No. 6,718,109).

Amended claim 39 recites, *inter alia*, “a center of the first core and a center of the second core are positioned substantially on a common axis.” As described above with regards to an example embodiment provided by the present applicants, positioning the core centers on the same axis allows for the center of beam spot propagating through the first core to be aligned with the center of beam spot propagating through the second core. As such, there is minimal propagation loss during spot size transformation.

Again, Oh teaches of a tapered electrooptic (EO) polymer waveguide coupling a passive polymer waveguide to an EO polymer waveguide. The tapered waveguide varies in *thickness* so that it can be sandwiched between the passive waveguide cladding layers. The tapered waveguide becomes gradually *thinner* and not narrower, as the tapered waveguide extends from the EO waveguide to the passive waveguide. Thus, the center of the EO waveguide

is positioned higher than the center of the passive waveguide. Consequently, the waveguide centers are not positioned on the same axis resulting in substantial beam spot propagation loss.

Oh does not disclose, teach, or suggest having the centers of the first and second cores positioned on a substantially common axis as recited in claim 39. Tobita and Bonar do not cure the deficiencies of Oh, since these references do not disclose the claimed centers positioned substantially on a common axis. Consequently, amended independent claim 39 is allowable.

Claims 20-25 depend from allowable claim 17, and are likewise allowable based on their dependency on claim 17 and also based on their recitations.

Withdrawn Claims

Claims 26-35 currently stand withdrawn from consideration. If claims 3, 17, and 19 are found to be allowable, Examiner Peng is kindly requested to contact the undersigned attorney to discuss these withdrawn claims.

The undersigned attorney would like to discuss the possibility of rejoining and allowing the withdrawn claims, if claims 3, 17, and 19 are found to be allowable, such as by amending the withdrawn claims to include allowable recitations from the allowed claims. It is hoped that such amendment might be able to be entered by an Examiner's Amendment, so as to expedite allowance of the application.

Alternatively, the undersigned attorney would like to discuss or otherwise confirm cancellation of the withdrawn claims, if the withdrawn claims cannot be amended and/or rejoined.

Information Disclosure Statements

The applicants filed a second Information Disclosure Statement (IDS) along with a form PTO-1449 having references listed thereon on July 11, 2005. It appears that an initialed copy of this form PTO-1449 was not included with the mailing of the present Office Action.

The applicants are also submitting herewith another IDS and form PTO-1449 with additional references listed thereon. Examiner Peng is kindly requested to consider the references listed in the form PTO-1449 of July 11, 2005 and in the form PTO-1449 submitted

herewith, and to confirm consideration of the references by returning initialed copies of these forms PTO-1449 along with the next communication.

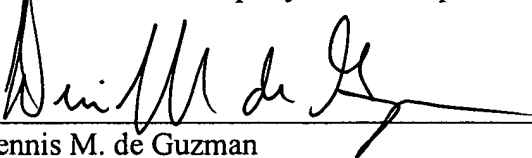
Conclusion

Overall, the cited references do not singly, or in any motivated combination, teach or suggest the claimed features of the embodiments recited in independent claims 1, 17 and 39, and thus such claims are allowable. Because the remaining claims depend from the allowable independent claims, and also because they include additional limitations, such claims are likewise allowable. If the undersigned attorney has overlooked a relevant teaching in any of the references, Examiner Peng is requested to point out specifically where such teaching may be found.

If the undersigned attorney has overlooked a teaching in any of the cited references that is relevant to the allowability of the claims, the Examiner is requested to specifically point out where such teaching may be found. Further, if there are any informalities or questions that can be addressed via telephone, the Examiner is encouraged to contact the undersigned attorney at (206) 622-4900.

Respectfully submitted,

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